European Eating Disorders Review
Eur. Eat. Disorders Rev. **16**, 37–43 (2008)

Weight Curves as Predictors of Short-Term Outcome in Anorexia Nervosa Inpatients

Ricarda Mewes*,†, Sefik Tagay and Wolfgang Senf
Department of Psychosomatic Medicine and Psychotherapy, University of Duisburg-Essen, Virchowstr. 174, 45147 Essen, Germany

Objective: The aim of the present study was to find factors that predict the short-term outcome of inpatients with anorexia nervosa (AN).
Method: Female inpatients with AN ($N = 100$) were divided into treatment completers ($N = 50$) and drop-outs ($N = 50$). Using stepwise linear regression the relationship of demographic data, illness history and patterns of weight gain to BMI gain up to discharge were analysed.
Results: Among drop-outs, 69% of the variance in BMI gain up to discharge was explained by length of the first half of treatment (FHT), average weekly BMI gain and average weight loss during FHT. Among completers, 52% of the variance in BMI gain up to discharge was explained by BMI at admission and average weekly BMI gain during the second half of treatment (SHT).
Discussion: Weight curves offer important information about short-term outcome for patients with AN. **Copyright © 2007 John Wiley & Sons, Ltd and Eating Disorders Association.**

Keywords: anorexia nervosa; inpatient treatment; short-term outcome; weight curves

INTRODUCTION

Anorexia nervosa (AN) is a severe psychiatric disorder, characterised by extreme, self-induced underweight. Risk of premature death is very high, the most common causes of death being complications due to starvation or suicide (Löwe, Zipfel, Buchholz, Dupont, Reas, & Herzog, 2001; Millar, Wardell, Vyvyan, Naji, Prescott, & Eagles, 2005). In the ten studies investigated by Nielsen, Møller-Madsen, Torben, Jørgensen, Pagsberg, and Theander (1998), the range of the standardised mortality rate was 1.4–17.8. The standardised suicide rate in the meta-analysis of Harris and Barraclough (1998) was 32.0. Of all mental disorders, AN and substance abuse disorders exhibit the highest risk for premature death (Harris & Barraclough, 1998).

In a meta-analysis, Steinhausen (2002) found that almost half (47%) of the surviving patients had positive long-term outcome and recovered from AN; 33% improved but still showed partial or residual features of AN, while 20% remained chronically ill. Co-morbidity at follow-up was high: 25% of the patients had an affective disorder and 25% an anxiety disorder. Other common co-morbidities included substance abuse, obsessive–compulsive disorder and obsessive–compulsive personality disorder. Steinhausen concludes that the prognosis of AN remains poor; overall generalisations

*Correspondence to: Ricarda Mewes, PhD, Department of Psychosomatic Medicine and Psychotherapy, University of Duisburg-Essen, Virchowstr. 174, 45147 Essen, Germany. Tel: +49-201-9597-022.
E-mail: ricarda.mewes@uni-due.de
†Graduate Psychologist (PhD).

Copyright © 2007 John Wiley & Sons, Ltd and Eating Disorders Association.
Published online 26 July 2007 in Wiley InterScience (www.interscience.wiley.com) **DOI**: 10.1002/erv.807

are difficult to make and there is as yet no clear picture of the factors that determine course and outcome.

In the inpatient treatment of AN, weight gain and medical stabilisation are the primary treatment goals (Patel, Pratt, & Greydanus, 2003). It is well known that patients with AN are ambivalent about treatment and often terminate treatment prematurely (Colton & Pistrang, 2004; Halmi et al., 2005; Kahn & Pike, 2001; Surgenor, Maguire, & Beumont, 2004). Several studies have found that weight at discharge from inpatient treatment is an important prognostic factor in relation to long-term outcome: the higher the weight at discharge, the better the long-term outcome (Bean et al., 2004; Baran, Weltzin, & Kaye, 1995; Fichter & Quadflieg, 1999; Lock & Litt, 2003).

Body Mass Index (BMI) at discharge depends to a very high degree on BMI at admission (Bean et al., 2004; Hebebrand et al., 1997). In order to investigate this influence further, the present study focuses on the difference between both BMIs, i.e. the BMI gain up to discharge, as an outcome variable. Patterns of weight gain during inpatient treatment and demographic data were included as possible predictor variables. The advantages of analysing patterns of weight gain include objective information concerning the complete period of treatment as well as the ease of their assessment.

To the best of our knowledge, there are only two studies that have investigated the relationship between patterns of weight gain during inpatient treatment and outcome in AN. Remschmidt and Müller (1987) reported that long-term outcome of 36 anorexic patients (average age 14.5 years and weight 36.5 kg at admission) was predicted by their weight course during inpatient treatment. Outcome after 4–12 years was medium to good, if: (1) the patient needed more than 47 days to reach the stabilised weight, (2) he or she had reached a stabilised weight of at least 64% of ideal weight and (3) the patient's weight course had shown high variability.

In the second study, Lay, Jennen-Steinmetz, Reinhard, and Schmidt (2002) examined 40 anorexic girls (average age of 15.2 years at first admission and an average BMI of 13.6), who had been re-admitted following relapse. The interval between both inpatient treatment phases was longer, if the target weight had been maintained for a longer period by the end of the first period of inpatient treatment. In addition, patients lost more weight after discharge from the first inpatient treatment, if: (1) the negative variation of the weight curve had been higher, (2) weight gain had been more rapid and (3) average BMI during treatment had been higher.

Both studies, therefore, suggest that patterns of weight gain during inpatient treatment can provide important information on the long-term prognosis of anorexic patients. However, because samples were small and adolescents were investigated, these results may not be generalised to adult patients. This is an important point, since age at first admission in AN and the number of admitted adults has increased substantially in the recent past (Wiseman, Sunday, Klapper, Harris, & Halmi, 2001).

Most treatment outcomes and prognostic studies for AN have focused on intermediate to long-term outcome. However, short-term prognostic factors may, or may not, be similar to long-term factors. Relatively few studies investigating possible predictors of short-term outcome are to be found. The aim of the present study was, thus, to identify factors that could predict short-term treatment outcome in a large heterogeneous sample of 100 women with AN. In particular, we investigated how demographic variables, illness history and patterns of weight gain during treatment predict BMI gain up to discharge; this was done separately for treatment drop-outs and completers. Our hypothesis was that patterns of weight gain would predict BMI gain up to discharge in both groups.

METHODS

Participants

The sample comprised a consecutive series of women with AN ($N = 100$) who received inpatient treatment at the Department of Psychosomatic Medicine and Psychotherapy at the University of Duisburg-Essen between August 1993 and March 2004. All patients met diagnostic criteria for AN according to ICD-10 (World Health Organization, 1993). The criteria for admission to the inpatient treatment programme were: (1) BMI < 15; (2) physiological complications (e.g. electrolyte disturbances, cardiovascular irregularities); (3) somatic illnesses that complicated treatment of AN (e.g. diabetes mellitus and asthma); (4) severe psychiatric or psychosomatic co-morbidity and (5) outpatient treatment that was no longer or not yet possible. Patients who did not fulfil all of these criteria were recommended for outpatient therapy. All patients

Copyright © 2007 John Wiley & Sons, Ltd and Eating Disorders Association.

DOI: 10.1002/erv

admitted with AN were included in the study sample.

Average age of onset was 19.0 years (SD = 5.4 years); however, more than half of the sample (56%) was between 13 and 18 years of age at onset. Prior to admission, most patients (62%) demonstrated a chronic course of illness (i.e. more than three years in duration), average duration being 81.6 months (SD = 71.0 months). Average age at admission was 26.2 years (SD = 8.3 years); only three patients were under 18 years. A total of 51 patients met criteria for the bulimic sub-type of AN, the remaining 49 patients being of the restricting sub-type. Two- thirds (65%) of the sample had already undergone inpatient treatment or outpatient psychotherapy elsewhere. Roughly half the sample (56%) had one or more co-morbid psychiatric disorder, the most common being major depression (37%); other co-morbidities were bulimia nervosa (17%), personality disorders (12%) and substance abuse disorders (8%). Mean BMI was 14.7 (SD = 1.5) at admission and 17.1 (SD = 2.0) at discharge ($t(99) = -15.01$; $p \leq .01$). Participants were divided into: completers ($N = 50$) who had reached and maintained their target weight over four successive weeks and drop-outs ($N = 50$) who had dropped out before the end of treatment. Drop-outs included patients who prematurely aborted treatment for their own reasons and patients who were discharged because of a persisting lack of progress or lack of motivation and compliance. Among the drop-outs, 29 had left during the first half of treatment and 21 during the second half of treatment. Mean duration of inpatient treatment for completers was 20.4 weeks (SD = 5.8); for drop-outs 10.9 weeks (SD = 8.7). Drop-outs had a mean BMI at admission of 14.4 (SD = 1.5) and gained 1.4 kg/m^2 up to admission, reaching a BMI of 15.8 (SD = 1.9). Completers had a mean BMI of 14.9 (SD = 1.5) at admission and 18.4 (SD = 1.1) at discharge.

Measures

Case records of participants were examined. Demographic information (i.e. age of onset, age at admission, marital status, education, employment status, duration of illness, weight loss up to admission, subtype of AN, previous treatments, co-morbidity) and all variables concerning weight curves over the course of treatment until the point of discharge were recorded. For the purposes of the study, discharge was defined as the point at which treatment was completed according to plan (for completers), or the point at which treatment was prematurely terminated by the patient or staff due to lack of compliance, poor motivation, etc. (for drop-outs). An example of a typical weight curve of completers is presented in Figure 1. Weight curves are characterised by weight gains and weight losses. Weight gains are widely predetermined by the agreements in the therapy contract but vary between weeks and patients. Weight losses differ in number, magnitude and duration both for patients and phases of treatment. Average weekly BMI gain, average number of weight losses, magnitude of weight loss and duration during

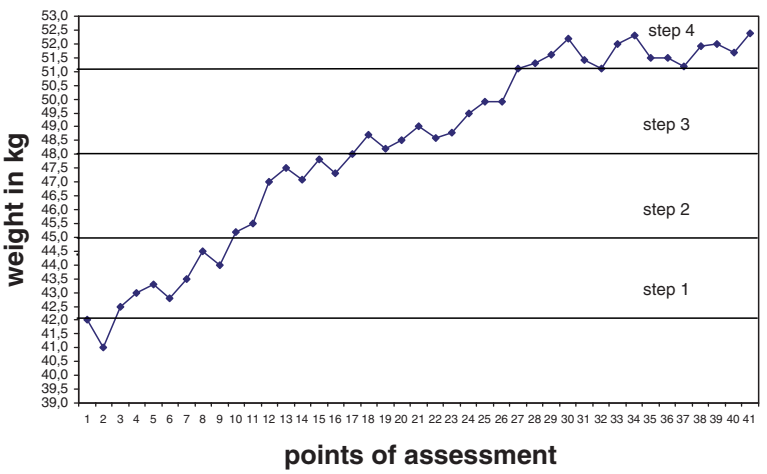

Figure 1. Example of a typical weight curve

Copyright © 2007 John Wiley & Sons, Ltd and Eating Disorders Association.

DOI: 10.1002/erv

treatment were the variables of interest concerning weight curves.

Weight variables were operationalised as follows:

- *Period of weight loss*: the period of weight loss of x grams, persisting from the first day of weight loss until the first day of weight stabilisation or weight gain.
- *Number of periods of weight loss*: The number of periods of weight loss recorded for the first (FHT) and for the second half of treatment (SHT).
- *Average magnitude of weight loss*: The magnitude of one period of weight loss was defined as the difference in grams between weight on the first day of weight loss and weight on the last day of weight loss. For each half of treatment, the magnitude of every weight loss was summed and divided by the number of periods of weight loss.
- *Average duration of weight loss*: The duration of each period of weight loss in days, which was summed for each half of treatment and divided by the number of periods of weight loss.
- *Average weekly BMI gain*: the increase in BMI for each patient during each half of treatment divided by the number of weeks of treatment.

Procedure

Treatment took place within a multidisciplinary context and focused on weight gain and stabilisation at a physiologically acceptable level, normalisation of eating behaviour in terms of both quantity and quality and work on intra and inter-psychological problems. Before an anorexic patient is admitted, he or she has to agree to a special contract including a target weight, which is fixed at 10% under ideal body weight. For calculating the ideal body weight, the Broca Index was used: weight (in kg) should equal ((height in centimetres -100) -15 * ((height in centimetres -100)/100)). Patients agree to a minimum weight gain of 500– 700 g per week. Following admission, treatment goes through four successive steps. The programme is highly structured with an emphasis on reinforcement. A detailed description of the treatment program is given in 'Das Behandlungsteam der Station für Essstörungen' (2004). The patient reaches the next step when he or she has gained one-third of the weight gain required according to the contract. Patients are weighed on Monday and Thursday mornings. After reaching the target weight, patients are treated for another 4 weeks in the day-clinic to stabilise their weight gain and to prepare for discharge. The FHT consists of the first two treatment steps in which the patient has to gain two-thirds of the required target weight. The SHT consists of the third step in which the patient is required to reach his/her target weight and attend the day-clinic. Patients may abort treatment for their own reasons or may be discharged before the end of treatment due to a persisting lack of progress (e.g. lack of weight gain for three successive weeks), or lack of motivation and compliance. This is the case for approximately 50% of the patients and these patients are examined in the drop-out group in the present study. Weight gain is recorded on millimetre paper. The resultant weight curves facilitate confronting patients with how they gain weight and improve comprehension of the patterns of weight gain.

RESULTS

Pearson's correlation coefficients were computed for the whole patient group between BMI gain up to discharge and age of onset, age at admission, duration of illness, lowest weight ever, weight loss up to admission, BMI at admission, number of weight losses in the FHT and SHT, average magnitude of weight loss in the FHT and SHT, average duration of weight loss in the FHT and SHT, average weekly weight gain in the FHT and SHT, as well as duration of the FHT and SHT. All variables that correlated significantly (i.e. $p < .05$) with BMI gain up to discharge were included in subsequent stepwise linear regression analyses as independent variables. BMI gain up to discharge was the dependent variable. Separate regression analyses were conducted for drop-outs and for treatment completers. Since more than half of the drop-outs left during the first half of treatment, regression analyses for these patients contained only variables from the FHT.

Correlations between BMI Gain up to Discharge and all Available Variables Across Groups

There was a strong correlation between BMI at admission and discharge ($r = .61$, $p < .01$). BMI gain up to discharge correlated positively with age of onset ($r = .22$, $p < .05$), duration of FHT ($r = .55, < .01$), average number of periods of weight loss during the FHT ($r = .37$, $p < .01$) and average weekly BMI gain during the FHT ($r = .46$, $p < .01$). In addition, BMI gain up to discharge correlated negatively with the average magnitude of a weight loss during the FHT ($r = -.40$, $p < .01$), average

Copyright © 2007 John Wiley & Sons, Ltd and Eating Disorders Association.

DOI: 10.1002/erv

Table 1. Stepwise linear regression analysis predictor variables on BMI gain up to discharge for the drop-outs*

		Explained variance	Standardised beta	t	p
1.	Duration of the FHT (weeks)	.52	.61	7.09	.00
2.	Average weekly BMI gain during FHT	.65	.32	3.67	.00
3.	Average magnitude of weight loss during FHT	.69	−.21	−2.41	.02

* $R^2 = .693$; $F(3, 45) = 33.83$; $p < .001$.
FHT: First half of treatment.

duration of a weight loss during the FHT ($r = -.47$, $p < .01$) and BMI at admission ($r = -.20$, $p < .05$). For the completers alone, BMI gain up to discharge correlated positively with average weekly BMI gain during the SHT ($r = .29$, $p < .05$).

Predictors of BMI Gain up to Discharge for Drop-Outs

Three predictors of BMI gain up to discharge among drop-outs could be identified (Table 1). Stepwise linear regression explained a high proportion of variance ($R = .83$, $R^2 = .69$, $p < .001$). As indicated by standardised beta values, the strongest predictor of BMI gain up to discharge was duration of FHT, followed by the average weekly BMI gain during FHT and average magnitude of weight loss during FHT. In other words, positive short-term outcome was associated with longer FHT, higher weight gain during FHT and less weight loss during FHT. BMI gain up to discharge was higher when duration of FHT and average weekly BMI gain during FHT had been higher. A negative relationship was found between BMI gain up to discharge and average magnitude of a weight loss in the FHT. BMI gain up to discharge was higher when the average magnitude of weight loss in the FHT was less.

Predictors of BMI Gain up to Discharge for the Completers

Stepwise linear regression for the completers identified two predictors of BMI gain up to discharge ($R = .72$, $R^2 = .52$, $p < .01$). BMI gain up to discharge was higher, if BMI at admission was lower and the average weekly BMI gain during the SHT was higher (Table 2). These two predictors together explained 51.8% of the variance BMI gain up to discharge.

DISCUSSION

The present study attempted to identify factors that could predict short-term inpatient treatment outcome in a heterogeneous sample of 100 women with AN. In particular, we investigated how demographic variables, illness history and patterns of weight gain during treatment predict BMI gain up to discharge among treatment drop-outs and completers. Among dropouts duration of the first half of treatment (FHT), average weekly BMI gain during the FHT and average magnitude of a weight loss in the FHT were the best predictors of BMI gain up to discharge. Among completers, BMI gain up to discharge was best predicted by BMI at admission and average weekly BMI gain during the second half of treatment (SHT).

An obvious shortcoming of the present study was that weight gain during treatment was the only indicator of short-term outcome. Although other important indicators, such as psychological factors were not taken into consideration, weight gain during inpatient treatment for AN is arguably an

Table 2. Stepwise linear regression analysis predictor variables on BMI gain up to discharge for completers*

		Explained variance	Standardised beta	t	p
1.	BMI at admission	.43	−.67	−6.49	.000
2.	Average weekly BMI gain in the SHT	.52	.29	2.87	.006

* $R^2 = .518$; $F(2, 46) = 24.71$; $p < .001$.
SHT: Second half of treatment.

Copyright © 2007 John Wiley & Sons, Ltd and Eating Disorders Association.

DOI: 10.1002/erv

important indicator of short-term outcome. Future studies could look at outcome in a broader sense and take psychological and other behavioural factors into consideration. A second limitation of the study is the absence of data on the long-term outcome of participants, which limits the generalisability of our findings.

It is likely that our patient group was comparatively difficult to treat, since duration of illness up to admission was long (on average approximately 7 years). Steinhausen (2002) and Treat et al. (2005) found long duration of symptoms to be a negative prognostic factor. Moreover, half of all patients ($N = 50$) had a BMI at admission under 15.0, which was a cut-off point for defining negative short-term outcome in the study by Pinter, Probst, Vandereycken, Pieters, and Goris (2004). Most patients in the present study had already received outpatient or inpatient treatment focused on eating disorders prior to admission and presumably these therapies had been of limited success, so that inpatient treatment was once more indicated. Patients who have previously dropped out of treatment have a higher probability of doing so again (Zeeck & Herzog, 2002). The drop-out rate of 50% in the present study, with a very conservative criterion for treatment completion, was within a normal range. Woodside, Carter, and Blackmore (2004) found a similar drop-out rate in a patient group with the same duration of illness. Halmi et al. (2005) found a drop-out rate of 49% in a patient group with a higher BMI at admission compared to our sample.

A possible explanation of the association between BMI gain up to discharge and duration of the FHT may be that patients who stay longer in the FHT gain weight more slowly than patients who have a shorter FHT. In agreement with our results, Remschmidt and Müller (1987) found that patients who need longer to reach the target weight had a better long-term outcome. A key implication of our findings may therefore be that slower weight gain may enable the AN patient to acclimatise to physical changes and more easily accept increasing weight.

The positive correlation between a high weekly BMI gain and BMI gain up to discharge is in opposition to the results of Herzog, Zeeck, Hartmann, and Nickel (2004) who found a lower weekly weight gain to be a positive predictor for short-term outcome. However, it is possible that the results of Herzog et al. (2004) were due to a selection bias: the patients in the group with the higher demanded weekly weight gain of 750 g had a significantly lower BMI at admission and a significantly higher duration of illness than patients in the group with the lower demanded weekly weight gain of 500 g, which are negative predictive factors as discussed above. Davies and Jaffa (2005) showed a non-significant difference of 0.1 kg in the average weekly weight gain between completers and drop-outs. It is worth noting that BMI gain up to discharge was higher when the average magnitude of weight loss in the FHT was less. In agreement with this, Müller and Remschmidt (1987) found that substantial and long periods of weight loss during treatment were negative predictors of long-term outcome.

Among completers 52% of the variance in BMI gain up to discharge was explained by the BMI at admission and the average weekly BMI gain in the SHT. BMI gain was greater if BMI at admission was lower and if the average weekly BMI gain in the SHT was higher. This finding may be easily explained. The criterion for a completer is that she reaches the target weight and maintains it over four successive weeks. The target weight is similar for all patients (approximately 10% under the ideal body weight). When weight at admission is lower, the patient must gain more weight to reach the target weight. Completers, therefore, gained more weight during treatment since their weight at admission was lower and they continued to gain weight after reaching their target weight. Because patients with a lower BMI at admission and a lower percentage of fat-free mass need a higher energy intake than patients with a higher BMI and more fat-free mass to gain the same amount of weight (Sunday & Halmi, 2003), patients with a lower BMI at admission should benefit from enhanced motivational support and concrete help with their eating behaviour by carers (i.e. one-to-one support at mealtimes for a certain time, a very detailed eating schedule etc.) to reach the target weight.

Our findings suggest that weight curves offer important information on short-term outcome in the inpatient treatment of AN and may help the clinician detect patients who are at risk of dropping out. On the one hand, this risk appears to be higher among patients who do not take their time and quickly reach the SHT. On the other hand, risk of drop-out appears higher for patients with a low weekly weight gain and high weight loss during treatment. Probably a steady, but not too high, rate of weight gain with small weight losses is the best way to attain high weight gain during treatment. It appears that the number of weight losses is not important for short-term outcome. Weight loss itself during inpatient treatment should not be considered a catastrophe; however, it is important for the patient to learn how to stabilise her weight and

Copyright © 2007 John Wiley & Sons, Ltd and Eating Disorders Association.

DOI: 10.1002/erv

how to avoid falling back into old and well-learned anorectic behaviour.

REFERENCES

Baran, S., Weltzin, T., & Kaye, W. (1995). Low discharge weight and outcome in anorexia nervosa. *American Journal of Psychiatry*, *152*, 1070–1072.

Bean, P., Loomis, C., Timmel, P., Hallinan, P., Moore, S., Mammel, J., & Weltzin, T. (2004). Outcome variables for anorexic males and females one year after discharge from residential treatment. *Journal of Addictive Diseases*, *23*, 83–94.

Colton, A., & Pistrang, N. (2004). Adolescents' experiences of inpatient treatment for anorexia nervosa. *European Eating Disorders Review*, *12*, 307–316.

Das Behandlungsteam der Station für Essstörungen. (2004). Stationäre Psychotherapie bei Magersucht als Behandlungsepisode im Rahmen eines Gesamtbehandlungsplans. *Psychotherapie im Dialog*, *1*, 1–12.

Davies, S., & Jaffa, T. (2005). Patterns of weekly weight gain during inpatient treatment for adolescents with anorexia nervosa. *European Eating Disorders Review*, *13*, 273–277.

Fichter, M., & Quadflieg, N. (1999). Six-year course and outcome of anorexia nervosa. *International Journal of Eating Disorders*, *26*, 359–385.

Halmi, K., Agras, W., Crow, S., Mitchell, J., Wilson, G., Bryson, S., & Kraemer, H. (2005). Predictors of treatment acceptance and completion in anorexia nervosa. Implications for future study designs. *Archives of General Psychiatry*, *62*, 776–781.

Harris, E., & Barraclough, B. (1998). Excess mortality of mental disorders. *British Journal of Psychiatry*, *173*, 11–53.

Hebebrand, J., Himmelmann, G., Herzog, W., Herpertz-Dahlmann, B., Steinhausen, H., Amstein, M., Seidel, R., Deter, H., Remschmidt, H., & Schäfer, H. (1997). Prediction of low body weight at long-term follow-up in acute anorexia nervosa by low body weight at referral. *American Journal of Psychiatry*, *154*, 566–569.

Herzog, T., Zeeck, A., Hartmann, A., & Nickel, T. (2004). Lower targets for weekly weight gain lead to better results in inpatient treatment of anorexia nervosa: A pilot study. *European Eating Disorders Review*, *12*, 164–168.

Kahn, C., & Pike, K. (2001). In search for dropout from inpatient treatment for anorexia nervosa. *International Journal of Eating Disorders*, *30*, 237–244.

Lay, B., Jennen-Steinmetz, C., Reinhard, I., & Schmidt, M. (2002). Characteristics of inpatient weight gain in adolescent anorexia nervosa: Relation to speed of relapse and re-admission. *European Eating Disorders Review*, *10*, 22–40.

Lock, J., & Litt, I. (2003). What predicts maintenance of weight for adolescents medically hospitalized for anorexia nervosa. *Eating Disorders*, *11*, 1–7.

Löwe, B., Zipfel, S., Buchholz, C., Dupont, Y., Reas, D., & Herzog, W. (2001). Long-term outcome of anorexia nervosa in a prospective 21-year follow-up study. *Psychological Medicine*, *31*, 881–890.

Millar, H., Wardell, F., Vyvyan, J., Naji, S., Prescott, G., & Eagles, J. (2005). Anorexia nervosa mortality in northeast Scotland, 1965–1999. *American Journal of Psychiatry*, *162*, 753–757.

Nielsen, S., Møller-Madsen, S., Torben, I., Jørgensen, J., Pagsberg, K., & Theander, S. (1998). Standardized mortality in eating disorders—A quantitative summary of previously published and new evidence. *Journal of Psychosomatic Research*, *44*, 413–434.

Patel, D., Pratt, H., & Greydanus, D. (2003). Treatments of adolescents with anorexia nervosa. *Journal of Adolescent Research*, *18*, 244–260.

Pinter, O., Probst, M., Vandereycken, W., Pieters, G., & Goris, M. (2004). The predictive value of body mass index for the weight evolution in anorexia nervosa. *Eating and Weight Disorders*, *9*, 232–235.

Remschmidt, H., & Müller, H. (1987). Stationäre Gewichts-Ausgangsdaten und Langzeitprognose der Anorexia nervosa. *Zeitschrift für Kinder- und Jugendpsychiatrie*, *15*, 327– 341.

Steinhausen, H. (2002). The outcome of anorexia nervosa in the 20th century. *American Journal of Psychiatry*, *159*, 1284–1293.

Sunday, S., & Halmi, K. (2003). Energy intake and body composition in anorexia and bulimia nervosa. *Physiology and Behavior*, *78*, 11–17.

Surgenor, L., Maguire, S., & Beumont, P. (2004). Drop-out from inpatient treatment for anorexia nervosa: Can risk factors be identified at point of admission? *European Eating Disorders Review*, *12*, 94–100.

Treat, T., Gaskill, J., McCabe, E., Ghinassi, F., Luczak, A., & Marcus, M. (2005). Short-term outcome of psychiatric inpatients with anorexia nervosa in the current care environment. *International Journal of Eating Disorders*, *38*, 123–133.

Wiseman, C., Sunday, S., Klapper, F., Harris, W., & Halmi, K. (2001). Changing patterns of hospitalization in eating disorder patients. *International Journal of Eating Disorders*, *30*, 69–74.

Woodside, D., Carter, J., & Blackmore, E. (2004). Predictors of premature termination of inpatient treatment for anorexia nervosa. *American Journal of Psychiatry*, *161*, 2277–2281.

World Health Organization. (1993). Tenth revision of the international classification of diseases, Chapter V (F): Mental and Behavioural Disorders. Diagnostic Criteria for Research.

Zeeck, A., & Herzog, T. (2002). Behandlungsabbrüche bei der stationären Behandlung der Anorexia Nervosa. *Nervenarzt*, *71*, 565–572.

Copyright © 2007 John Wiley & Sons, Ltd and Eating Disorders Association.

DOI: 10.1002/erv